# Saudi Arabia

**Saudi Arabia has no domestic environmental technologies industry and therefore imports all of the goods and services required to meet its environmental goals. Its preference for imported goods, pronounced water scarcity issues, and burgeoning oil and gas industry make it a top market for U.S. environmental technologies.**

| Overall Rank | Air Pollution Control |
|---|---|
| 6 | 8 |
| **Water** | **Waste & Recycling** |
| 3 | 9 |

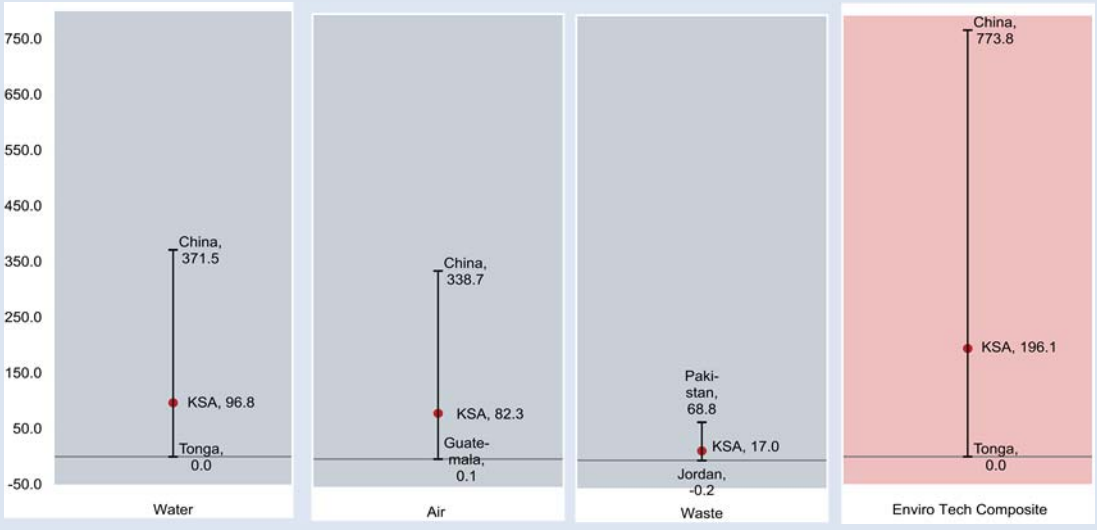
Saudi Arabia ranked 6th globally on the 2015 Top Markets Study (TMS) with a composite environmental technologies score of 196.1. Within the environmental industry segments, Saudi Arabia ranks 3rd for water with a score of 96.8, highlighting the relatively important role that water and wastewater technology plays in Saudi's desert climate. Saudi Arabia ranks 8th for air pollution control markets with a score of 82.3 and 9th for waste and recycling with a score of 17.0 (see appendix x for global rankings).

**STATE OF THE ENVIRONMENTAL REGIME**

Saudi Arabia hosts a moderately stringent environmental regime. The Environmental Business Journal-OECD Environmental Stringency Survey, which ranks environmental regimes on a scale from 1 – 7 (with 1 being lax and 7 being among the most stringent in the world), scored Saudi Arabia a 4.2 in 2012, a 0.7 point improvement on its 2005 score of 3.5. Saudi Arabia's score of 4.81 on the World Economic Forum's 2011 Index for Regulatory Stringency (on a similar scale to EBJ-OECD) reflects a slightly higher perception of stringency from the perspective of international businesses operating there.

Saudi Arabia's ranking in the same survey for enforcement is 21st globally with a score of 4.87 reflecting the Kingdom's improving enforcement efforts. This is evidenced both by the government's recent allocation of US$300 million for environmental protection and pollution control[xc] and its 2009

**Figure 1: Saudi Arabia's *Top Markets* Scores**



announcement of the formation of a Green Police unit to improve monitoring and enforcement of environmental rules.[xci]

**MARKET BARRIERS**

The Environmental Technologies Trade Advisory Committee (ETTAC) identified the following barriers as most problematic for environmental technologies companies attempting to export to or work in Saudi Arabia:

1. **Local partnership is required.**
   Foreigners are prohibited from engaging in trading activities in Saudi Arabia, thus necessitating a Saudi business partner in any business with international transactions. Furthermore, the Saudi government appears to favor joint-venture arrangements with Saudi partners in the lead in public tenders over those led by foreign firms.
2. **Certification and safety approvals fail to recognize equivalents from the exporting market.**
   The Saudi Food and Drug Authority applies unnecessary additional testing requirements for products that have dual use in water analysis and medical applications (such as spectrophotometers). Additional testing imposes undue burden in terms of cost and time-to-market for technologies that are applied to environmental rather than medical uses.

**MARKET OPPORTUNITIES**

**AIR POLLUTION CONTROL**

*Air Emissions Control and Monitoring*

The Presidency of Meteorology and Environment (PME) not only monitors and regulates air quality, but also issues tenders. The Kingdom is a signatory to the Kyoto Protocol and recently has undertaken an effort to enforce emissions standards for large industrial facilities.

Saudi efforts to monitor air quality have increased alongside efforts to develop and enforce environmental standards and regulations, creating demand for ambient air quality surveys and emission source monitoring. The Saudi government has ordered all major industrial projects to conform to international air standards and allocated $300 million for environmental protection and pollution controls in 2010. Major emitting industries in Saudi Arabia include oil refineries, power generation, petrochemical development, cement plants, and metals foundries. Saudi's annual imports of air pollution control and monitoring equipment is estimated at $50 million,[xcii] with U.S. companies meeting almost 75 percent of demand.

The industrial cities of Jubail and Yanbu are prime examples of adoption of advanced monitoring and control technologies within a finite industrial zone for existing and new facilities, presenting continued vast opportunities to U.S. technology providers.

Technologies and Services in Demand:

- Continuous emissions monitoring systems
- Fenceline monitoring equipment
- Ambient air monitoring equipment
- Source emissions measurement technologies
- Environmental testing and laboratory instrumentation and services
- Dry sorbent injection technologies
- Flue gas desulfurization equipment
- Activated carbon injection technologies
- Inspection, adjustment, maintenance, repair services
- Selective catalytic reduction technologies
- Selective non-catalytic reduction controls

**WASTE MANAGEMENT AND RECYCLING**

*Municipal and Industrial Waste*

In July 2013, the Saudi Cabinet approved new Municipal Solid Waste (MSW) management regulations. The new regulations aim to ensure the implementation of an integrated framework for municipal solid waste management in the country. Studies conducted by the Ministry of Municipal and Rural Affairs in collaboration with the Saudi Arabian Basic Industries Corporation (SABIC) recommend that the ministry establish a joint stock company for the treatment and recycling of solid waste in the Kingdom using the latest technology to dispose of the massive quantity of waste generated in the country in an environmentally friendly manner. The ministry is known to be finalizing the executive bylaws for the management of solid waste.

Recycling and solid waste management is regulated by, and related tenders are issued, by the Ministry of Municipal and Rural Affairs in conjunction with local municipalities. A substantial portion of the US$ 3

billion budget of Saudi Arabia's Ministry of Municipality and Housing is dedicated to handling, processing, managing and disposal of solid waste.[xciii] Saudi Arabia generates 15.3 million tons per year, the majority of which ends up untreated and landfilled.[xciv]

While few recycling initiatives exist, there is increasing demand for incineration technologies to deter the creation of more landfills. Production of domestic, industrial, chemical and hazardous wastes is also growing in Saudi Arabia. The burgeoning healthcare sector, which generates an estimated 50,000 tons of healthcare waste per year, also offers increasing commercial opportunities. The Kingdom currently boasts 1,850 health centers, with 79 hospitals under construction, and plans to establish an additional 250 new primary care centers,[xcv] creating demand for a variety of incineration and medical waste handling technologies.

Technologies and Services in Demand:

- Hazardous waste transportation
- Waste sampling, characterization and analysis
- Waste minimization
- Hazardous waste removal and tank cleaning
- Contaminated land site assessment and remediation
- Industrial and hazardous waste treatment and disposal
- Air pollution control equipment and monitoring devices
- Solid waste management systems

**WATER AND WASTEWATER TREATMENT**

Water resources are regulated by the Ministry of Water and Electricity and tendered by the National Water Company (NWC). The NWC was created in 2008 to oversee water tenders and manage the development of Public Private Partnerships (PPP) for water infrastructure development.[xcvi] The NWC is currently a government-owned entity, but is designed to evolve into a private sector holding company as the Saudi water sector becomes completely privatized.[xcvii]

According to the NWC's plans, between 2012 – 2020 approximately US$ 66.4 billion will be invested in new water infrastructure and related services, US$ 30 billion of which will be directed towards capital expenditures.[xcviii] Similarly, the Water and Electricity Company (WEC) was created in 2003 as a limited-liability corporation to manage the consumer market for water and power with an overarching mission of keeping tariffs low.[xcix] The Saline Water Conversion Corporation (SWCC) operates the state's 36 desalination facilities.

*Municipal Water Treatment and Water Efficiency*

Demand for water services in Saudi Arabia is high as urbanization and population growth increases but groundwater resources dwindle. The 2014 Saudi Arabia Country Commercial Guide estimates that US$ 5 billion are need annually over the next 20 years for new water infrastructure investments. With the development of 12 Operations-and-Management joint ventures, in the near term there are substantial opportunities for management of existing facilities as well as new facility construction and upgrades. The NWC is expected to invest US$ 12.8 billion in capital expenditures and US$ 17.9 billion in operations expenditures in fresh water treatment and distribution between 2012 and 2020.[c]

The NWC privatization scheme will transfer management to private companies to ameliorate the problem of non-revenue water. This will be achieved by improvements in transmission infrastructure, leakage detection systems, and enhancements to revenue collection, which include upgrading metering and billing technologies and services. There is also an emphasis on improving the sewer system and creating separate systems for storm water management. Approximately 40 percent of the Saudi Arabia utilizes combined sewers which has exacerbated flooding in recent years.[ci]

Technologies and Services in Demand:

- Engineering services
- Operations and management services
- Pipes, pumps, and valves
- Advanced filtration
- Membrane filtration
- Reverse Osmosis
- UV Disinfection
- Ozone Disinfection
- Water loss technology
- Smart metering

*Desalination*

Water demand surpasses renewable water resources by approximately 10 billion cubic meters a year.[cii] Saudi Arabia meets excess demand through seawater desalination, though desalination remains critical for groundwater treatment in the Kingdom as well due to high groundwater salinity. The SWCC currently operates 36 desalination facilities that address 60 – 70

percent of freshwater demand.[ciii] Expansion of the Saudi desalination program will be needed to meet future fresh water needs in the Kingdom.[civ]

The 2012 – 2015 period is a robust time for growth in desalination projects with capacity growing by 9.5 percent annually.[cv] The SWCC plans to invest US$ 11.7 billion in capital expenditures and US$ 4.5 billion in operations expenditures through 2020,[cvi] highlighting the vast opportunities for desalination technology and Engineering, Procurement, and Construction (EPC) firms. The SWCC has traditionally granted large EPC contracts for the development of facilities and continues to do so; however, it has also recently included Build Own Operate models in its portfolio that will expand the desalination market further into services, albeit at a slower pace than other areas of Saudi's water sector.

There are six major projects expected to tender during the 2015-2016 timeframe. The largest is the Jubail 3 thermal and reverse osmosis project estimated to be worth US$ 3 billion.[cvii] The remaining five projects are all saline water conversion plants utilizing reverse osmosis; they include Rabigh Phase 4, US$ 1.2 billion; Umluj SWRO, US$ 30 million; Aqeer SWRO, US$ 20 million; and, South Dhahran SWRO, US$ 200 million.

Technologies and Services in Demand:
- Engineering services
- Management and operations services
- Multistage flash distillation
- Reverse osmosis membrane technology
- Solar and energy efficient desalination technology

*Industrial Wastewater Treatment and Water Reuse*

Saudi Arabia's lack of a fee system for wastewater treatment services makes it a difficult economic prospect for privatization without government subsidies. Despite issues with fees, the Saudi privatization blitz has also touched the industrial water sector with the introduction of the private Marafiq utility to serve the industrial cities of Jubail and Yanbu.[cviii]

Wastewater treatment is growing robustly in the Kingdom; the NWC is expected to invest $23.9 billion in capital expenditures and $11.9 billion in operations expenditures in wastewater treatment between 2012 and 2020.[cix] The Kingdom's wastewater treatment capacity is expected to expand by 12.8 percent annually.[cx] The NWC plans to enhance the economic attractiveness of wastewater projects by facilitating waste-to-energy programs within treatment plants and promoting the sale of treated wastewater for industrial uses.[cxi] Waste-to-energy projects are key components of the national wastewater management program and are likely to emphasized biogas combined heat and power facilities.[cxii]

NWC has signed private sales contracts of treated wastewater to Saudi Aramco and power generation company, Saudi Electric Company.[cxiii] At the writing of this report, one major project was announced for the 2015-2016 tender period: the South Dhahran Wastewater Treatment Plant will provide municipal treatment services for Dhahran and treated effluent will be used by Saudi Aramco for industrial purposes. The project is expected to have a daily capacity of 70,000 $M^3$ and is estimated at US$ 28 million.[cxiv]

Water reuse provides growing opportunities. The Saudi government has instituted treatment standards for various modes of reuse. A stated goal of increasing reuse by 16 percent by 2016 further underscores this priority.[cxv] Focusing water reuse on industrial purposes has the intended impact of reducing the amount of saline conversion necessary for potable uses and is economically more viable in terms of the operational costs associated with desalination versus membrane-based wastewater treatment. The NWC intends to play a major role in the water reuse market and estimates that sales from reused wastewater will exceed those for potable water in six large cities by 2030, yielding US$ 900 million in revenues over the forecast period.[cxvi]

Technologies and Services in Demand:
- Engineering and construction services
- Water reuse equipment and services (process specific)
- Advanced filtration
- Membrane filtration
- Reverse osmosis
- UV Disinfection
- Anaerobic digestion
- Nitrification
- Biological denitrification

**U.S. GOVERNMENT AGENCY ACTIVITIES**

*U.S. Environmental Solutions Toolkit*

The Toolkit compiles EPA's environmental regulations, related underlying research, and a list of U.S. companies that provide technologies necessary to implement similar environmental regulatory actions

abroad. The Toolkit is used by EPA officials or environmental consultants as a reference tool within bilateral activities that focus on addressing environmental concerns. In 2015, an Arabic-language version of the Toolkit will be introduced to facilitate ease of use in Saudi Arabia.

*Power-Gen International Buyers Program*

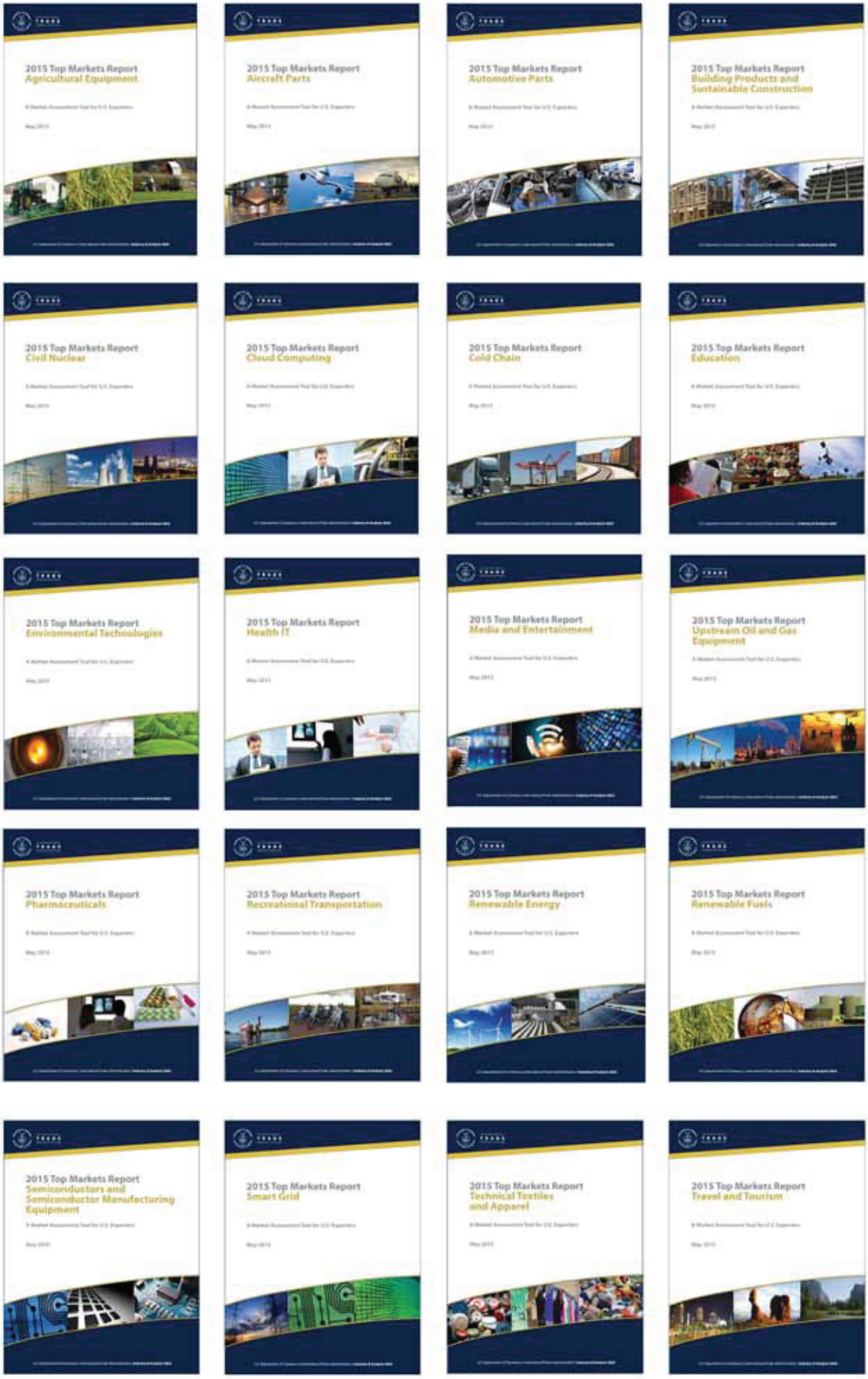
Power-Gen, one of the leading U.S. power generation equipment and services trade shows, has partnered with the Department of Commerce's International Buyer Program to encourage foreign participation in the show. This platform is leveraged to discuss policies and exchange technical information regarding power plant emissions control with Saudi participants and to foster business relationships between Saudi end-users and U.S. emissions control providers.

*WasteExpo International Buyers Program*

WasteExpo, one of the leading U.S. waste management trade shows, has partnered with the Department of Commerce's International Buyers Program to encourage foreign participation in the show. This platform was leveraged to exchange relevant technical information with Saudi participants and to introduce Saudi buyers to U.S. waste management technology providers.

*Water Environment Federation Technical Exhibition and Conference (WEFTEC) International Buyers Program*

The Department of Commerce, through its International Buyers Program, leads a delegation of Saudi officials and business representatives to WEFTEC to explore relevant U.S. technologies and work with U.S. exporters on approaches to water resource management.

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